

IN THE CLAIMS:

Claims 1-28 (Cancelled)

Claim 29 (Original) A layered structure comprising:

a substrate having an upper surface of single crystalline Si, and
a layer of SiC over said upper surface,
said Si/SiC layer interface having an abrupt change in C concentration of more
than 1×10^{18} atoms/cc over a layer thickness in the range from about 6 Å to about
60 Å,
and wherein the oxygen in said SiC layer is less than 1×10^{17} atoms/cc.

Claim 30 (Original) The layered structure of claim 29 wherein said silicon carbon alloy is single crystalline.

Claim 31 (Original) The layered structure of claim 29 wherein said silicon carbon alloy is polycrystalline.

Claim 32 (Original) The layered structure of claim 29 further including a layer of Si over said layer of SiC, said SiC/Si layer interface having an abrupt change in C concentration above 1×10^{18} atoms/cc over a layer thickness in the range from about 6 Å to about 60 Å and wherein the oxygen in said Si layer is less than 1×10^{17} atoms/cc.

Claim 33 (Original) The layered structure of claim 29 wherein said layer of SiC includes a p-type dopant in the range from about 1×10^{18} to about 1×10^{21} atoms/cc and wherein said p-type dopant profile can withstand furnace anneals to temperatures of 850° C and rapid thermal anneal temperatures to 1000° C.

Claim 34 (Original) The layered structure of claim 29 wherein said layer of SiC includes a n-type dopant in the range from about 1×10^{18} to about 1×10^{21} atoms/cc.

Claim 35 (Original) The layered structure of claim 33 further including a layer of Si over said layer of p-type doped SiC, said p-type doped SiC/Si layer interface having an abrupt change in C concentration above 1×10^{18} atoms/cc over a layer thickness in the range from about 6 Å to about 60 Å and wherein the oxygen in said Si layer is less than 1×10^{17} atoms/cc.

Claim 36 (Original) The layered structure of claim 35 wherein said p-type doped SiC/Si layer interface having an abrupt change in dopant concentration above 1×10^{18} atoms/cc over a layer thickness in the range from about 6 Å to about 60 Å.

Claim 37 (Original) The layered structure of claim 34 further including a layer of Si over said layer of n-type doped SiC, said n-type doped SiC/Si layer interface having an abrupt change in C concentration above 1×10^{18} atoms/cc over a layer thickness in the range from about 6 Å to about 60 Å and wherein the oxygen in said Si layer is less than 1×10^{17} atoms/cc.

Claim 38 (Original) The layered structure of claim 37 wherein said n-type doped SiC/Si layer interface having an abrupt change in dopant concentration above 1×10^{18} atoms/cc over a layer thickness in the range from about 6 Å to about 60 Å.

Claim 39 (Original) The layered structure of claim 29 further including a layer of SiGe over said layer of SiC, said SiC/SiGe layer interface having an abrupt change in C concentration above 1×10^{18} atoms/cc over a layer thickness in the range from about 6 Å to about 60 Å and wherein the oxygen in said SiGe layer is less than 1×10^{17} atoms/cc.

Claim 40 (Original) The layered structure of claim 33 further including a layer of SiGe over said layer of p-type doped SiC, said p-type doped SiC/Si layer interface having an abrupt change in C

concentration above 1×10^{18} atoms/cc over a layer thickness in the range from about 6 Å to about 60 Å and wherein the oxygen in said SiGe layer is less than 1×10^{17} atoms/cc.

Claim 41 (Original) The layered structure of claim 34 further including a layer of SiGe over said layer of n-type doped SiC, said n-type doped SiC/Si Ge layer interface having an abrupt change in C concentration above 1×10^{18} atoms/cc over a layer thickness in the range from about 6 Å to about 60 Å and wherein the oxygen in said SiGe layer is less than 1×10^{17} atoms/cc.

Claim 42 (Original) A layered structure comprising:

- a substrate having an upper surface of single crystalline Si, and
- a layer of SiGeC over said upper surface,
- said Si/SiGeC layer interface having an abrupt change in C concentration above 1×10^{18} atoms/cc over a layer thickness in the range from about 6 Å to about 60 Å,
- and wherein the oxygen in said SiGeC layer is less than 1×10^{17} atoms/cc.

Claim 43 (Original) The layered structure of claim 42 wherein said SiGeC layer is single crystalline.

Claim 44 (Original) The layered structure of claim 42 wherein said SiGeC layer is polycrystalline.

Claim 45 (Original) The layered structure of claim 42 further including a layer of Si over said layer of SiGeC, said SiGeC/Si layer interface having an abrupt change in C concentration above 1×10^{18} atoms/cc over a layer thickness in the range from about 6 Å to about 60 Å and wherein the oxygen in said Si layer is less than 1×10^{17} atoms/cc.

Claim 46 (Original) The layered structure of claim 42 wherein said layer of SiGeC includes a p-type dopant in the range from about 1×10^{18} to about 1×10^{21} atoms/cc and wherein said p-type

dopant profile can withstand furnace anneals to temperatures of 850° C and rapid thermal anneal temperatures to 1000° C.

Claim 47 (Original) The layered structure of claim 42 wherein said layer of SiGeC includes a n-type dopant in the range from about 1×10^{18} to about 1×10^{21} atoms/cc.

Claim 48 (Original) The layered structure of claim 46 further including a layer of Si over said layer of p-type doped SiGeC, said p-type doped SiGeC/Si layer interface having an abrupt change in C concentration above 1×10^{18} atoms/cc over a layer thickness in the range from about 6 Å to about 60 Å and wherein the oxygen in said Si layer is less than 1×10^{17} atoms/cc.

Claim 49 (Original) The layered structure of claim 48 wherein said p-type doped SiGeC/Si layer interface having an abrupt change in dopant concentration above 1×10^{18} atoms/cc over a layer thickness in the range from about 6 Å to about 60 Å.

Claim 50 (Original) The layered structure of claim 47 further including a layer of Si over said layer of n-type doped SiGeC, said n-type doped SiGeC/Si layer interface having an abrupt change in C concentration above 1×10^{18} atoms/cc over a layer thickness in the range from about 6 Å to about 60 Å and wherein the oxygen in said Si layer is less than 1×10^{17} atoms/cc.

Claim 51 (Original) The layered structure of claim 50 wherein said n-type doped SiGeC/Si layer interface having an abrupt change in dopant concentration above 1×10^{18} atoms/cc over a layer thickness in the range from about 6 Å to about 60 Å.

Claim 52 (Original) The layered structure of claim 42 further including a layer of SiGe over said layer of SiGeC, said SiGeC/SiGe layer interface having an abrupt change in C concentration above 1×10^{18} atoms/cc over a layer thickness in the range from about 6 Å to about 60 Å and wherein the oxygen in said SiGe layer is less than 1×10^{17} atoms/cc.

Claim 53 (Original) The layered structure of claim 46 further including a layer of SiGe over said layer of p-type doped SiGeC, said p-type doped SiGeC/SiGe layer interface having an abrupt change in C concentration above 1×10^{18} atoms/cc over a layer thickness in the range from about 6 Å to about 60 Å and wherein the oxygen in said SiGe layer is less than 1×10^{17} atoms/cc.

Claim 54 (Original) The layered structure of claim 47 further including a layer of SiGe over said layer of n-type doped SiGeC, said n-type doped SiGeC/SiGe layer interface having an abrupt change in C concentration above 1×10^{18} atoms/cc over a layer thickness in the range from about 6 Å to about 60 Å and wherein the oxygen in said SiGe layer is less than 1×10^{17} atoms/cc.

Claim 55 (Original) A layered structure comprising:

- a substrate having an upper surface of single crystalline Si, and
- a multitude of layers of materials selected from the group consisting of Si, SiGe, SiC, and SiGeC over said upper surface,
- said Si/SiC, Si/SiGeC, SiGe/SiC and SiGe/SiGeC layer interfaces having an abrupt change in C concentration above 1×10^{18} atoms/cc over a layer thickness in the range from about 6 Å to about 60 Å,
- and wherein the oxygen in said carbon containing layer is less than 1×10^{17} atoms/cc.

Claim 56 (Original) The layered structure of claim 55 wherein said layers are single crystalline.

Claim 57 (Original) The layered structure of claim 55 wherein said layers are polycrystalline.

Claim 58 (Original) The layered structure of claim 55 wherein said carbon containing layers include a p-type dopant in the range from about 1×10^{18} to about 1×10^{21} atoms/cc and wherein said p-type dopant profile can withstand furnace anneals to temperatures of 850° C and rapid thermal anneal temperatures to 1000° C.

Claim 59 (Original) The layered structure of claim 55 wherein said carbon containing layers include a n-type dopant in the range from about 1×10^{18} to about 1×10^{21} atoms/cc.